

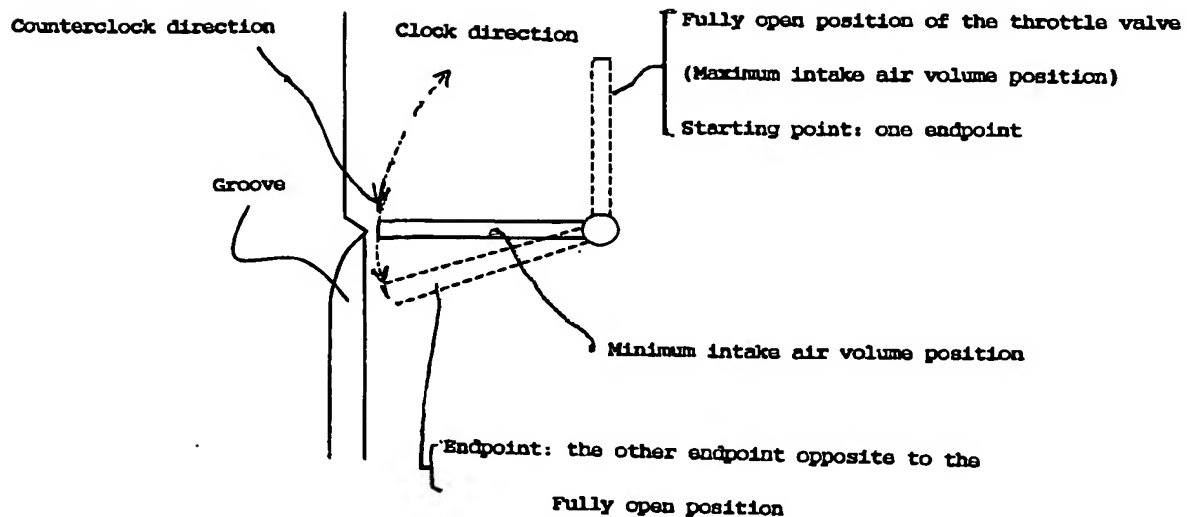
REMARKS

In the Election/Restriction Requirement, a number of issues were identified for which resolution is required. The Applicants have amended the claims to more clearly recite the inventive air intake control device, and to specifically address each of the issues identified in the August 31, 2006 Action.

Overall Understanding of the Invention: With regard to the Examiner's overall understanding of the arrangement and operation of the present invention, the Applicants note that there are three throttle positions defined in the amended claims: (i) a fully-open position at one end of a throttle rotation range (Fig. 2, position 3); (ii) a mechanically fully-closed position at the opposite end of the rotation range (Fig. 2, position 3b); and (iii) a minimum intake air volume position, which is between the fully-open and the fully-closed range endpoints (Fig. 2, position 3a).

The device also includes a bypass (Fig. 2, groove 5). The minimum intake air volume position is shown in Fig. 2 at the beginning of the groove (Fig. 2, top edge of inlet taper 6), where the amount of air flow area around the throttle valve is at its minimum. Once the throttle valve is rotated into its fully closed position 3b, the presence of the bypass groove 5 results in an intake air area which is larger than the area at position 3a (the minimum intake air volume position). A schematic illustration, which enlarges the elements shown in the original drawings for explanation purposes, is shown below for the Examiner's convenience:

Ref Fig. 2



As a result of these arrangements, during normal operation the present invention permits control of air flow to a minimum volume at position 3a, in the same manner as in prior art throttle valves, which had their minimum air flow at their mechanically fully closed position.¹ However, unlike prior art throttle valves which did not flow enough air to start and operate their engine if their throttle valve stuck in the fully closed position, the present invention's throttle valve fully closed position 3b (which has a greater air flow area than the area at the minimum intake air volume position 3a) permits sufficient air flow to allow the engine to be operated. See, e.g., Specification at 2:21-3:5. The Applicants

¹ In case of a diesel engine (*i.e.*, unlike a gasoline engine), the throttle valve (3) is located at the fully open position during normal traveling, because fuel injection control is all that is needed to control power output. Specification at 6:7-8. The throttle valve operates only when air supplied to a combustion chamber is cut off at engine shutdown, when air flow is reduced for engine speed stability during idling, and when negative pressure is produced to return exhaust gas to the upstream side of the combustion chamber. Specification at 6:8-14.

respectfully submit that the foregoing amendments to claims 1, 2 and 11 and the specification clarify the various throttle positions, and thereby address this issue.

Inconsistency Between Claims 3 and 4: Claim 4 has been amended to correct its dependency to claim 2, therefore resolving the “increase” vs. “constant” issue.

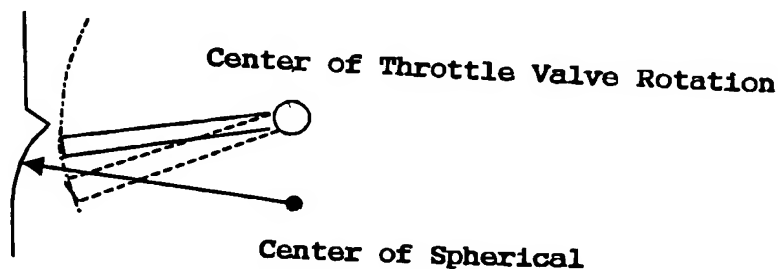
Antecedent Basis for “The Rotary Locus” and “The Groove”: The Applicants have amended claims 5-7 to address the rotary locus antecedent basis, and amended claims 17 and 20 to address the groove antecedent basis.

The “Spherical” Issue: The comments state that claim 7 does not make sense “as spherical could not be constant volume.” The Applicants respectfully draw the Examiner’s attention to Figs. 5 and 6, and provide the following explanation, which is consistent with the recitation of this feature in the claims.

As shown in Figs. 5 and 6, the inner wall of the intake passage includes spherically-shaped surfaces 2a (as compared to the flat walls of the intake inner surface shown in Fig. 2). The spherical surface 2a is generally located near the loci of points in the throttle valve’s path (the “rotary locus”), and thereby provides an altered air flow volume response as compared to the response with a flat passage wall. In addition to the effects on air flow made possible by including a spherical surface, the position of the center of the radius of the intake passage spherical part may also be adjusted to further alter the air flow volume response. When the throttle valve’s center of rotation is not at the center of the spherical part 2a (as shown in the reference drawing Ref-Fig 1 below), it is possible to increase the volume of air passing through the air intake passage as

the throttle valve rotates from the minimum intake air volume position 3a toward the mechanically fully closed position (endpoint 3b). On the other hand, when the throttle valve rotation center is co-located at the center of the spherical shape of the intake passage surface, it is possible to maintain a constant volume of air passing through the air intake passage as the throttle valve rotates from the minimum intake air volume position 3a toward the endpoint 3b.

Ref Fig. 1



In view of the foregoing, the Applicants respectfully submit that the spherical recitation in claims 6 and 7 is readily understandable by one of skill in the art.

Claim 18: The Applicants have amended claim 18 to correct the typographic error “a groove to by the bypass” to “a groove forming the bypass.”

CONCLUSION

In view of the foregoing amendments and remarks, the Applicants submit claims the present Application is now in condition for allowance. Early and favorable consideration, and issuance of a Notice of Allowance for the pending claims is respectfully requested.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 056208.52861US).

Respectfully submitted,

December 28, 2006

A handwritten signature in dark ink, appearing to read "Mark H. Neblett", is written over a horizontal line.

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